

Mastering Tests: Different Types of Tests

Tests are structured in several distinct ways. Each type requires a different strategy, so here are some tips on how to approach several common test types:

- **Multiple Choice/Objective**
- **True/False**
- **Math and Science Problems**
- **Short Answer**
- **Essay**
- **Open Book**

Multiple Choice/Objective Tests

- Read the directions very carefully. You might be asked to select the one incorrect option, or to choose more than one answer.
- Be sensitive to the wording of the question and answers. Is the wording extreme or moderate?
- Eliminate first any answers that are obviously wrong.
- Choose the best answer. Try not to second guess yourself.
- If you are stuck, select "all of the above", if that is an option. The purpose of the exam is to teach and to test, so "all of the above" is correct slightly more often than you might expect.

True/False

- On True/False tests the statement must be 100% true. A difference of just one word could make a difference in the answer, so read carefully.
- Key words in answers that are usually false: no, never, none, always, every, entirely, only.
- Key words in answers that are usually true: sometimes, often, frequently, ordinarily, generally.
- When in doubt, guess "true". You have a 50% chance of being right, and since the purpose of the exam is to impart accurate information, tests tend to be weighted slightly toward true answers.

Math and Science Problems

- Read the problem carefully to discern precisely what the question is asking. Be able to state the problem in your own words.
- List the "knowns," implied "unknowns," and the parameters of the problem using your own notation. What relationship do the assembled facts have? Do any formulae jump to mind? If so, write them down. Even if you do not ultimately use them, having a reference page can help as you decide how to proceed.
- Draw any appropriate diagrams or illustrations.
- Does the problem remind you of something from your text or lecture notes? If so, what was the case then? Does it apply to this problem?
- Mentally round the numbers in the problem so that they are friendlier to work with. A relationship between two numbers might suggest itself if you view .00000199 and .00000398 as simply 2 and 4.
- A problem can often be broken down into several smaller problems done in sequence. Rather than asking, "How can I get from A to D in one move?", outline the steps between A and D. Even if you can only work out how to get from A to B, you have still solved one third of the total problem..

- Sometimes you can solve a problem by working backwards. Using the previous example, if you have solved for B, but still cannot find C, see if you can solve another part of the problem by working backwards from D to C.
- If you get stuck, move along and go back to the problem after attempting the others. Never erase your work. You don't know what might be useful to you later, and you may get partial credit for some work.
- If you go back to a problem and still cannot solve it, circle the work that you want the instructor to grade (assuming you have more than one approach on the page). Cross out the superfluous work, leaving it still readable.
- Check your work. Be certain your answer is in the proper form. Ask yourself, "Does the solution make sense? Is it reasonable?"

Short Answer

- Use your initial survey of the test to determine how much time to spend on each response.
- Consider how much space is provided and how many points the question is worth.
- Short answer responses require no introduction and should be brief and to the point.
- Do not fall into the trap of elaborating on a short answer question because you feel confident of your response. Answer succinctly and continue onward.

Essays

- Consider exactly what the question is asking. Are you asked to analyze, interpret, or describe? Be certain that your response is framed appropriately.
- Think before you write. Take a moment to construct a brief outline of your response. This will save you time in the long run and help you to keep your essay on task.
- If the essay asks you to answer multiple questions, be certain to address each systematically. Weigh your responses evenly unless the question specifically requests otherwise. If you answer one half of the essay in three pages and the other half in one paragraph, you might only receive 60% credit for the entire essay.
- Get to the point. Avoid wordy, rambling sentences by using brief transition words (e.g. accordingly, similarly, finally).
- Avoid personal opinions. Your answers should be factual and cite supporting evidence unless otherwise requested.
- If you are running out of time and haven't already made an outline, list the remaining points you wish to make in your essay. You might get partial credit for these concepts even if they are not presented in essay form.
- Check your spelling and grammar when you are done.
- As you proofread your essay, ask yourself whether you have answered the question(s). If you have not, what points might you briefly insert or elaborate upon to bring the essay into focus?

Open Book Exams

Open book exams are sometimes given when a student needs to refer to charts or other materials in the text. You must prepare for an open book exam as thoroughly as you would for a closed book exam. You won't have time to reread and look for formulas during the test. Number and index your textbook so that the parts to which you may need to refer are easy to find.

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Some of the anxiety associated with test-taking comes from fear of the unknown. Since you cannot know in advance what questions will be asked on an exam, it's easy to be overwhelmed by the possibilities. Actual knowledge about an upcoming test can help to counter nervousness. You can assemble a surprising amount of information about how your tests will probably unfold that will help you focus your studies.

Define the Exam

You have several avenues available to help you to find out pertinent information about upcoming tests. Actively use the subject syllabus and website and the notes that you take in class to figure out what will be covered on your tests (see the following section on Resources). Don't hesitate to ask Professors, Recitation Instructors, Teaching Assistants, and others, any and all of the following questions about upcoming tests:

- How much time will you be given to take the exam?
- Can you bring a calculator or formula sheet? Notes?
- Will it be open book?
- What will the format of the test be? Will it be multiple choice, short answer, essay, problems, or a combination of these? If combination, what is the breakdown (for example, 40% short answer, 60% essay)?
- What percentage of your final grade is this exam worth? Do not dwell on this, but use it to gauge the amount of effort you plan to put into preparation. Should you spend 20+ hours preparing for a test worth 15% of your grade, at the expense of two other exams worth 30% each?
- What will the exam cover? Textbook or online readings? Lecture content? Handouts?
- Will this test cover one unit (material taught since the last test) or is it cumulative (everything taught in the subject so far)?

Use the Resources You Have

While an instructor will probably not provide an exam outline, you do have the next best thing—the subject syllabus and websites.

- It's a good idea to mark up the syllabus to show when each topic will be tested. Use different color highlighters or another system that works for you.
- The subject website will offer several tools for review, including: lecture notes and slides, grading schemes, bibliographies, study hints, and possibly recorded lectures as well.
- Check Open Courseware for similar resources from past versions of the subject. The syllabus for 8.01, for example, requires students to view Professor Walter Lewin's world-renowned lectures from earlier years.
- As you study, you will likely have questions, so organize your thoughts and approach the instructor or TA during office hours. Instructors do not want students to be frustrated by their exams and will usually answer any reasonable question about a test. Questions about the coursework and exams show that you care about the subject and your progress, and also that you are thinking ahead.

Remember that an instructor might have different expectations for each test, especially for the midterm and final exam. **Never assume that subsequent tests will be administered in the same fashion as the first.**

Mastering Tests: Draft a Study Plan

Creating a realistic and effective plan to prepare for a test includes key steps:

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- **Start early**
- **Survey the available time**
- **Set priorities**
- **Choose a study style**
- **Stick to your plan**

Start Early

- Begin preparing when you receive the subject syllabus. The syllabus is the road map of the class. Be sure to enter all test dates in your personal calendar or planner.
- Clearly identify the various “tasks” that you will have to do while you study. Use key words like “read”, “write”, “create outline”, “memorize”, “rewrite”, etc.
- Look at your schedule and work backward to set some deadlines like “review lecture notes” or “skim textbook chapters”. Revisit these deadlines as the term progresses.
- Seek help in a timely fashion for those areas you find difficult and challenging.

Survey the Available Time

- Once you've constructed your balanced schedule for the term, look for blank spaces that can be used for extra study in exam weeks.
- Be sure that these will be times when you're rested.
- A week or so before the test, take a few minutes to fill in those blanks on a copy of your weekly schedule. For example, for a test on Friday you might see:
 - Sunday: 6 hours
 - Monday: 2 one-hour blocks
 - Tuesday: 2 two-hour blocks
 - Wednesday: 2 one-hour blocks
 - Thursday: 5 hours
- **Make the most of the time you have.** One-hour blocks between classes can be great times to review notes, practice problems, or organize yourself before speaking with your TA. If you discount these smaller pockets of time, you could waste 4-8 hours of potential study time.
- **Make your study sessions reasonable in length, working no longer than 2 hours without a break.** If you plan to spend 5 hours on Thursday studying, you should plan to take a 30-minute break in the middle to recuperate. Your mind needs time to assimilate and process the new information. Most importantly, taking breaks will make it easier to approach difficult material without becoming distracted and discouraged.

Set Priorities

- Figure out areas in which you're confident and others in which you need intensive review. Quiz and test scores may tell you this directly. If it isn't clear, try the following technique.
- From your syllabus, enter each topic on one line of our Test Study Checklist. Fill in reading assignments, homework, and handouts or other material that will be tested. Leave the lecture column blank for now, since you will review all lecture notes. You may have some other blank boxes: not every topic has reading or written assignments to review.
- Highlight the areas in which you are least confident.

- Make note of the areas most emphasized in lecture, recitation, or tests. Information that your instructor spent extra time teaching and correcting will likely receive special attention on the exam.
- Note on your checklist any areas in which your lecture or book notes are vague, incomplete, or misleading. Plan to compare notes with a friend in these areas.
- If you work well in study groups, plan to cover your weaker areas (and share your strengths) in group. TAs and tutors can also help you fill in gaps.
- Schedule review meetings early and keep the appointment, so that you don't fall behind in your preparation.

Choose a Study Style

Break down your studies in one of two ways: **Study the most critical material first** or **Study the material in the chronological sequence that you learned it.**

- **Most critical first:** Study the highest priority material first, then the secondary material, which happens to have been taught earlier, etc. As you master one level, move down to the next. This method works well if the concepts you are learning in class are not closely interrelated.
- **Chronological sequence.** If the material is interrelated and continually builds on previous knowledge, then it makes more sense to take a chronological approach. Begin your studies with the material from the first class and move forward in chronological order, spending only small amounts of time in low priority areas and more time in higher priority areas. This review will give you a stronger basis from which to master the more important material when you get to it. If you choose to study in chronological order, be careful to pace yourself so that you do not leave a critical block to do the night before the exam simply because it occurs last on your checklist.
- **For both styles,** spend the most time on your highest priority work, a medium-amount of time on your second-priority work, and the least time on your lowest priority work (usually by skimming it). Before moving on, the question of whether or not to memorize often comes up when preparing for tests. MIT students learn early that they aren't supposed to rely on their memories when they approach their coursework. While this information can help students to break habits learned in high school, it is not good to apply an all or nothing approach to this subject.

It can be helpful to memorize in the following two instances. First, commit to memory information that comes up all of the time (formulas, equations, common ways of solving problems, etc.) so that there is no chance that time will be wasted on repetitive tasks. Second, organize material that you need to recall on a test into lists that can be mentally accessed via acronyms, etc.

Stick to Your Plan

Here are some techniques to make certain your thoughtful planning stays on track.

- **Choose a good time and location to study.**
- **Bring your checklist and stay on task.** If you get stuck on a concept or problem, make a note on your checklist to speak with your TA, then move along. If you do fall behind, try to schedule an extra hour to catch up. But don't panic: your study plan is a guideline, not an absolute.
- **Practice.** Rework tests and sample problems from the textbook, noting how and why techniques are implemented. If you can't explain the reasoning behind a process, you don't understand it enough to get full credit on a test.
- **Note similarities and differences among problems.** This helps to cultivate the skill of thinking flexibly. How and why does a solution work? How else could a problem be solved? How does the knowledge you are acquiring relate with other concepts?

- **Keep a list of formulae and major concepts.** As you study, jot down items that you need to memorize. Review this material when you are caught standing in line or with time to spare between classes.
- **Selectively review your texts.** Do not reread your textbook; you have already done it once and to do so again would overload you. Review only sections you have highlighted, any notes you made in the margins, formulae, definitions, and chapter summaries. You should be refreshing your memory and clarifying information, not assimilating it in extreme detail.
- **Don't over-prepare.** Is your study plan too ambitious and unrealistic? Trying to gain a "perfect" understanding of all the material can overwhelm and paralyze you. While it's true that MIT exam questions often challenge you to apply concepts creatively, there is no way to anticipate every possible application of what you are learning. Thinking flexibly is a skill you will develop with practice, not by extreme studying. Construct and follow a reasonable study plan, and remember that instructors are testing what you can be reasonably be expected to know—a finite and manageable amount of work.
- **Too little time?** Do you not have enough time to cover everything on your moderate and realistic list? Unfortunately, you will have to choose which things to study, and plan not to cover the rest. Only you will be able to judge which information is most critical to you, but remember that **some studying is always better than no studying.** Don't give up because it's impossible to learn everything. Incremental progress is still progress, so cover what you can well. Quality, not quantity, is the key.

Mastering Tests: Demonstrate Your Knowledge

The time has come. You have to take the test. Do you panic now? No! You're calm, cool, collected. You simply follow the next steps in your preparation:

- **The Day Before the Test**
- **The Night Before the Test**
- **The Day of the Test**
- **Taking the Exam**

The Day Before the Test

Double-check the logistics:

- What is the date and time of the exam?
- Where is the exam? Is it in your regular classroom or in a larger testing location?
- How much time will you be given to take the exam?
- Can you bring a calculator or formula sheet?
- Will it be open book/notes?

The Night Before the Test

- Study a reasonable amount.
- Review lists of formulas, equations, or other things you already know. It's too late now to learn new material.
- Assemble everything that you will need for the exam—pens, pencils, books and calculators if allowed, a bottle for water.
- Get a good night's sleep.

The Day of the Test

- Have breakfast, even if it is only a bite on the run, and avoid caffeine. You're probably jittery enough as it is.
- Go to the testing room early with the materials you will need.
- Don't let the nervousness of classmates infect you. Try to spread some calm.

Taking the Exam

- Listen to the instructor or proctor for any last minute details.
- Write your name on the exam.
- Read the instructions carefully.
- Skim through the exam once to get a sense of how much time to spend on each question or problem.
- Begin with the easier questions. Answer them as quickly as possible without sacrificing accuracy.
- Do not spend a long time on questions worth only a little. Be succinct and move along.
- Always show your work and never erase. Partial credit is your friend!
- Keep track of the time and check your work.

Mastering Tests: Following a Test

Once a test is taken and the grade is received, it can be easy to simply not think about the test again. This is especially true if you receive a less than satisfactory grade, as few of us want to revisit the feeling of not doing well.

Mastering Tests: Final Exams

As you approach final exams you need to shift your perspective from a local/subject view (preparing for relatively short tests on limited material), to a global/term view (preparing for several large, comprehensive tests that occur at the same time). Consider the following:

- Planning for final exams is more than preparing for several long tests.
- Choose how to prioritize your subjects and decide how and where to concentrate limited amounts of time and energy.
- Plan for the exams themselves and also for your final assignments and projects, which are just as important. How can you get everything done and finish on top?

Here's a set of useful steps:

- **Gather information**
- **Assess your progress**
- **Organize your time**

Succeeding in final exams is the culmination of all the work you've done to improve your study and test-taking skills, manage your time, and maintain your health through the term. Staying organized and managing stress as finals approach will translate into solidified knowledge and your best grades.

However, ignoring test or problem set results is not helpful. It is more effective to find a way to learn from your mistakes and to use what you learn to improve the way you perform on tests.

Rather than accept what you couldn't do on past test(s), consider taking the following steps that will help you to be successful.

1. Thoroughly read your test and compare it to the notes that the professors usually post to help students understand what they should have been able to do on the tests. Take caution that you never mark or write on the test directly because it may be possible for you to receive more credit, if you talk with the professor.
2. After looking at the notes on the test, devote some time to studying the test, learning to work the problems, and reading material from the class. While doing so, take notes and formulate some questions.
3. Look over the test and available information. After doing so, if you feel you have given the class material your best effort, schedule appointments with your TA's, your professors, recitation instructors, your Advisor, and any students who may be able to assist you (even if you did fairly well). Take a list of questions and your untouched test with you. Ask them questions that are specific to the test, along with larger more general questions on the subject itself.
4. Finally, as part of future study strategies you develop for this class, include information you learned (incorporating ways you were advised) for improving future test performance.

Final exams - Gather Information

- **The Final Exam Schedule is posted near the beginning of each term.** On Add Date (fifth week), once your schedule is settled, check the schedule and record each exam date, time, and location in your planner. Check again on Drop Date (tenth week) and in the last week of classes to make sure that none of your testing dates, times, or locations have changed. Sometimes changes are made later in the term, even just before Finals Week.
- **Gather all of your notes, handouts, texts, assignments, and tests for each subject and sort them into chronological order so they will be easy to find again.** Check your gathered material against the syllabus. Do you have all of the important information? Are you missing notes for any lectures? Do you have all of the assignments and tests back that you should? All of your textbooks? Will the final exam cover the entire term's material or some subset? This is the first step in planning your study time.

Final Exams - Assess your progress

All exams are not created equal. Some count more toward your term grade, some less. Some cover the whole term, others just material since the last hour exam. You are probably better prepared in some subjects than others. Based on these differences, you can begin setting priorities for your exam study time.

It may help to use our Term Assessment Form to clarify your thoughts, look at your term as a whole, and possibly spot trends or problem areas. You may want to do this once a week before Drop Date (ninth week of term) and again a month before Exam Week. As you review your results, consider these questions as well:

- **Do you know your approximate grade level in each subject?** If not, speak with the instructor or TA as soon as possible. You have to be clear about your progress in order to set realistic goals. Your instructor and TA can also suggest tools for improvement, including alternative approaches to the material and possibly additional instruction or tutoring. Don't be afraid to ask: your instructor wants you to succeed by mastering the subject.
- **Are you having difficulty with just one subject?** Again, have a conversation with your instructor or TA right away. Ask them whether you can still pass the subject.
 - **If you still have a chance of passing,** ask what grade you need to achieve on the final exam to pass the subject. Ask for help in studying for the final.

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- **If your performance in the subject is borderline**, the instructor will likely encourage you to keep working and make this subject a high priority during the final exam period.
- **If there's no chance that you can pass**, meet immediately with your advisor. If it's still before Drop Date, you and your advisor will most likely decide you should drop. After Drop Date, with your advisor's input, choose one of two options. You can continue to attend class and submit work, laying a good foundation for the next time you take the subject. In this case, be careful not to sacrifice subjects that can be improved for one that cannot. On the other hand, sometimes both instructors and students have been surprised by a high final exam grade. Or you can stop working, accept the failing grade, and move on. If you choose to stop working, be sure to inform the instructor, so that s/he knows how to grade you.
- **Are you having difficulty with two or more subjects?** What are your realistic chances for success in each subject? Will intense effort in one jeopardize your performance in others? If you drop a subject (before Drop Date), will you be able to recover in your other subjects? If Drop Date has passed, meet with your advisor immediately to discuss how best to recover the term. You may also want to meet with a dean in Student Support Services to discuss your difficulties and explore possibilities for extensions or withdrawal.
- **How can you improve your grade in a subject late in the term?** After you have met with your instructor, TA, and advisor, you will have a good idea how you are doing in a subject and where your problem areas lie. Review these areas and redo incorrect problems from former problem sets and tests. Do practice problems and alternative problem sets from your textbook. Bring problems you cannot solve to your TA or a tutor for clarification. Continue practicing within your study group. Set realistic goals for yourself, and work on making progress in manageable steps.
- **How many hours can you realistically spend preparing for each exam given the time remaining?** This is the last question on the term assessment, and one to consider carefully. You will have assignments and unit tests for which to prepare in the weeks before exams begin. Make a list of these other commitments and their due dates. How much time will you need to prepare for them? How late in the term is it now? What resources will you need (such as access to practice problems, labs, computers, instructors, or TAs), and when will they be available to you?

Final Exams - Organize Your Time

Ideally, you would start this process at least three weeks before final exams begin, but you can easily adapt the following techniques to a shorter period.

- Use a planner or calendar program to chart each week remaining before your final exams and Finals Week itself.
- Date each sheet or entry, and fill in your time commitments between now and your last exam. Include all remaining class meetings, recitations, and labs; assignment due dates, testing dates, and final exam dates; and other appointments like review sessions or study groups.
- You won't have classes during Finals Week, so it will look like you have lots of time then, and you will, but don't leave everything for that week. Planning ahead is the key to performing well and reducing exam stress.
- Make a list of important tasks that you need to accomplish before the term ends (such as meeting with instructors, TAs, or study groups; getting notes back from a friend; packing by a certain date) and make those arrangements. Add any new dates to your planner and To-Do List.

Use Your Study Time Productively

Plan out your study time in loose blocks, so you're more likely to keep up with all of your subjects and be ready for each exam as it occurs. Say that you plan to study four subjects for 20 hours each over a two-week period. On average, this means you would be studying about 5.7 hours/day, which is manageable. To accomplish the same task in one week, you would be studying 11.4 hours/day, which is significantly more difficult.

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Studying is most effective when you plan to concentrate for reasonable periods of time (blocks of two or three hours), and take reasonable breaks (15-30 minutes) between them. It is also more effective to work on more than one subject over the course of an evening, rather than working on a single subject all night. The change of subject will refresh your mind and keep you more alert and engaged. It's easy to spend too long on a subject in which you are not making progress.

Consider the difference between these two approaches to studying three subjects over the course of two days:

- **Student A:** Studies subject 1 from 4-6pm, subject 2 from 6:30-8:30pm and Subject 3 from 9 until 11pm on Monday and then studies Subject 3 from 4:30-6:30pm, Subject 1 from 7-9pm and Subject 2 from 9:30-11:30pm on Tuesday
- **Student B:** Studies Subject 2 from 9:30pm on Monday until 2am on Tuesday, Subject 1 from 5:30-9:30 pm and Subject 3 from 9:30pm on Tuesday and until 2:30am on Wednesday.

Each student completes four hours of study in three subjects, but Student A has more options. If she has difficulty in any of her subjects on Monday, she could follow up with the TA or her study group on Tuesday. In the meantime, she will have made some progress in her other work. Student B is in a more difficult situation, as he faces long study sessions and less opportunity for follow-up. While both students will have done six hours of studying by 11:00 p.m. on Tuesday, Student B will likely be more tired and stressed, and unfortunately he still has work to do.

People have individual work styles. Your ideal block of study time may be only one hour or it may be four hours. Perhaps it is easier for you not to change subjects once you are making progress. Adapt these guidelines to work for your preferences and style.

Most of the advice on previous pages in this section applies to final exams as well. Review especially the section on Different Types of Tests.

Mastering Tests: Test Anxiety

Preparing for and taking exams is stressful by definition. Your challenge is to channel that stress constructively and avoid letting it become anxiety—unfocused worry. Here are a few techniques for managing exam stress.

- **Create a study plan and stick to it.** Planning ahead puts you in charge, and not the calendar. Being in charge makes most of us happy.
- **Eat and sleep well.** These are essential, not just on the day of the test, but every day. Health and happiness go hand in hand.
- **Relieve stress, don't avoid it.** Have you ever watched television, intending to unwind, and found yourself under incredible internal pressure to return to your work? You need more than a distraction; you need to play that stress away. Go swimming or lift weights, do some yoga or meditate, take a long walk or do some volunteer work off campus. These activities use different parts of your brain and funnel stress out through your muscles.
- **Ignore your inner critic.** Imagine if someone came into your room while you were studying and said, "I don't know why you are bothering to do this. You are so far behind that you will never catch up. It's utterly hopeless." You would never tolerate this treatment from another person; yet when that little voice inside your head begins berating you, it has the sound of authority. Recognize these thoughts for what they are, feelings of fear and self-doubt. Yes, you have a lot of work to do, but you most certainly can do it.
- **Remember to ask for help if you need it.**